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West Europe Report

SCIENCE AND TECHNOLOGY

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CONTENTS

SCIENCE POLICY

TRANSPORTATION

BRITISH BIOTECHNOLOGY ACTION GROUP TO GET GOVERNMENT FUNDS

Paris AFP SCIENCES in French 28 Apr 83 p 41

[Article: "London--Creation of a 'Biotechnology' Action Group in Great Britain"]

[Text] On the initative of the "chemist" of the British government, Professor Ron Coleman, a "Biotechnologies Action Group" has just been created in Great Britain.

In the spirit of its promoter, who succeeded in rallying the most eminent specialists of three large companies--British Petroleum, Glaxo, and ICI--this group is intended to determine the biotechnological sectors in which Great Britain should take action, through research and investment, if it does not want to be excluded from an important potential market in the coming years.

This group, directed by Professor Ron Coleman, thus includes--in addition to his assistant, Roy Dietz--Professor Peter Mugleton, who will participate at Glaxo in the production of penicillin and direct the Glaxo Animal Health subsidiary; Pat Gould, former manager of the 4,000-ton demonstration unit for the production of protein by the British Petroleum fermentation process; Professor Alan Coleman, former manager of the Biochemistry Department of ICI Pharmaceuticals, recently appointed Manager of the Biosciences Research Group of the ICI Group.

What is expected from these specialists with different and complementary backgrounds is a stimulation of British industry and specialized laboratories.

Among the first of this group's actions, already under way, is the launching of twenty industrial projects for the installation, with government funds, of new research facilities in the national laboratories (new fermentors, research on biocaptors, separation processes, vaccines, continuous fermentation, cell culturing, mushrooms, etc.), for which the government has granted 9 million pounds. The launching of a private financing campaign--satisfactory thus far--to promote biotechnologies, to supplement the 16 million pounds allocated to this sector by the Department of Industry, is also foreseen.

12368
CSO: 3698/330

BRIEFS

COMMERCIAL CONTRACTS FOR BIOGEN--The international biotechnology corporation Biogen announced today the delivery of its first commercial product manufactured using genetic technology, recombinant DNA. According to a delivery agreement, the product, the internal antigen of the hepatitis B virus, has been sold to the Green Cross Corporation of Osaka, Japan. Green Cross will use this product in its test kits to determine the presence of hepatitis B in human blood. Biogen has similar contracts for the delivery of hepatitis B antigens with Hoffmann-LaRoche & Co., Ltd. and Behringwerke AG in addition to Green Cross. [Text] [Paris LES ECHOS in French 11 May 83 p 6] 9865

SWEDISH, FINNISH BIOTECHNOLOGY COOPERATION--Finnish Sugar, Inc. and Alfa-Laval will be working together on projects in the field of biotechnology. These will mostly have to do with the development of grocery products and pharmaceuticals. The presidents of both companies met together recently to work out possible courses of action. "It isn't clear yet what the cooperation will involve, but we will be examining the areas where we can find common denominators," said Jan Hildingstam, director of EWOS, Inc., an affiliate of Alfa-Laval. EWOS, Inc. has been working together for a long time with the Finnish food products company Turunmuna in Turku, which was bought out awhile back by Finnish Sugar. Their cooperation has been in the field of water management, particularly biotechnical methods of fish feeding. [Text] [Stockholm NY TEKNIK in Swedish 28 Apr 83 p 23] 9584

CSO: 3698/345

ELECTRONICS

ASEA DEVELOPS FIRST ELECTRONIC INDUSTRIAL CONTROL SYSTEM

Stockholm DAGENS NYHETER in Swedish 18 Jun 83 p 8

[Article by Anders Nordstrom

> [Text] Just in time for its 100-year anniversary, Asea is taking the big step forward into the hard electronics market.
>
> The new product is the electronic control system "Asea Master." It is Asea's biggest investment to date, having cost 200 million kronor in the developmental stages and 15 million kronor in marketing.

The system has recently been made ready for sale, and in the course of the first year of sales--from May 1983 to May 1984--Asea expects a sales volume of some 300 million kronor. This figure is expected to double itself in the course of three years.

"This system takes us a step ahead of all of our competitors who produce electronic control systems for industrial use," said Percy Barnevik, vice-director of Asea.

"But it isn't a big enough step ahead, and we will have to keep on with intense developmental work in the next few years. Otherwise our competitors will catch up with us pretty quickly.

"In 1982, some 40 percent of the billion kronor that Asea spent went for research and development in the electronic sector. This year the figure will probably climb to 50 percent."

According to Percy Barnevik, it is also necessary that Asea soon succeed in increasing foreign sales of its Asea Master system.

"Might Have a Hard Time"

"The next generation of electronic control systems will cost even more to develop than this generation. If we don't achieve a large sales volume quickly on this system, we will have a hard time meeting the development costs," Barnevik said.

Asea hopes for a sales volume in Asea Master systems of about 300 million kronor. But at the same time, the company as a whole reaches a sales volume of some 26 billion.

"It's true, if you look at figures like that, 300 million doesn't seem like much," admitted Dristen Martensson of the electronics division.

"But we are thinking of using this system ourselves for our products, for example in our industrial robotics division and in the supervision of power stations."

Oil Extraction

"Altogether, we think that between 5 and 7 billion kronor of our total sales will eventually be dependent on this electronic investment."

The first orders have already come in. Among other things, the system will be used for supervision in drilling and oil extracting in the Gullfaks oil fields in the North Sea.

The system has also been sold to Grange Metal Works in Vasteras, where it will be used in supervision of a cold selection mechanism, and to Scanian Farmers, which is going to automate its fodder production factory in Aarhus.

Within Asea itself, the Asea Master system is the source of much activity. Already 1,100 of the company's 56,000 employees have sat through training sessions to learn about the new system, and the internal training program is far from being finished.

9584
CSO: 3698/345

ELECTRONICS

UK FIRMS DEVELOP NEW CHIP-CARRIER IC PRODUCTION METHOD

Paris ELECTRONIQUE ACTUALITES in French 29 Apr 83 p 15

[Article by JPF: "A Flexible Circuit and Heater for Chip Carriers"]

[Text] Flexible printed circuits are becoming the means of reducing the stress exerted by chip carriers by variations in temperature.

Two British companies, Welwyn Electric and SB Enterprises, have just independently developed a technique for producing printed circuits for chip carriers which does not require copper, copper-invar or quartz-fiber laminates but which allows for dissipation of the thermal energy of the circuits under operation.

What is sought in this technique is not so much a complex material whose expansion coeefficient would be close to that of ceramic, like that of laminates with an invar or quartz-fiber core, but rather a device that simultaneously allows for thermal dissipation and the absence of stress on circuit connections.

The base of the printed circuit is thus a flexible circuit on which the chip carriers will be welded. The flexible circuit has the advantage of easily accommodating the expansion of the integrated circuit while avoiding breakage of integrated circuit connections, which can occur with the use of a conventional printed circuit.

The final structure must, however, be mechanically rigid. This means that the flexible circuit must maintain a certain freedom. The solution adopted by the two companies lies in an aluminum or copper sheet that has a metal stud for every integrated circuit. Each of these studs goes through the holes provided for this purpose in the flexible circuit and comes into mechanical contact with the chip carrier. To ensure the lowest possible stress between the studs and the chip carriers, while allowing for sufficient thermal conduction, silicon grease is provided between the metal stud and the chip carrier. To optimize thermal dissipation, an aluminum sheet is placed on top of the chip carriers and attached to the studded sheet. The assembly is only a few millimeters thick.

In the case of several assemblies, they can be stacked on top of one another, and the additional aluminum sheet is eliminated, the underside of the next assembly serving its purpose.

The purpose of this new development involves, obviously, cost price. The laminates with reduced thermal expansion cited earlier are expensive, and this process would be much cheaper. It should, however, be noted that there is a technique that uses an elastomer support as an intermediate element to absorb the dimensional stresses caused by thermal expansion.

The two companies have created a European-size card processing 48 Koctets of EPROM memory on an approximately 10 x 15 cm^2 area.

12368
CSO: 3698/330

ASEA INTRODUCES NEW LINE OF MODULAR PROCESS CONTROL EQUIPMENT

Paris ELECTRONIQUE ACTUALITES in French 29 Apr 83 p 5

[Text] Though ASEA has been moving quite cautiously so far in the French process control market, tne company now intends to speed up its pace. Its vehicle for doing so is a new line of systems, the Asea Master, which has just been officially introduced in Paris. This new line is characterized by its high degree of modularity, both in hardware and in software. The firm spent no less than $20 million on research and development for this new system. This is the biggest investment in a product in the entire history of this Swedish firm, which this year is celebrating its 100th anniversary.

Actually, the Asea Master has been undergoing trial use abroad for the past 2 years. About 50 pilot facilities are equipped with this system, primarily in Sweden (for process control and command in the fields of nuclear power, steel, and food processing); in Holland (for valve control in the "Delta" project); in Norway (in offshore oil); and in Denmark (for the control of small electric power plants operating on wind power).

The system is highly flexible because of its modular design. This new family is without a doubt a first for ASEA in this area. The Swedish firm, realizing that its automation equipment had in the past been designed primarily for large industrial facilities, wanted to use the Asea Master to develop a family of products and software that would be more in line with the present-day realities of the world market. Demand is now centering on simpler and more effective control and monitoring systems that are capable of responding to today's and tomorrow's needs. That is, systems which can evolve.

In terms of hardware, the Asea Master family now consists of two entirely compatible systems: the Masterpiece series 100 and 200, operated by 8 or 16-bit microcomputers. The 100 series may have up to 128 inputs/outputs per module. Three models are available: the 120 with digital inputs and outputs; the 140, with numerical or analog inputs and digital outputs; and the 160, with analog and digital inputs and outputs. The latter model can also function in a closed circuit operation. The 200 series offers the same possibilities as the 100 series, but these are more powerful systems, whose capacity can reach 1,300 inputs/outputs. Because of their structure, functional modules can also be added, such as an event recorder or a statistics interface. A series 300 driven by a 32-bit microcomputer is now being developed, and should be ready next September.

Programming is done independently of the microcomputers, using Master Aid modules. These modules can also be used to look for defects, for simulation and documentation. There are three such modules, selected according to the user's requirements:

a. The Master Aid 111 is in fact a small manual terminal, built around a single-line alphanumerical display and a keyboard. Designed primarily as a maintenance aid, it can also be installed permanently in a system in order to be used as a communications unit.

b. The Master Aid 112 is used in programming the 100 series. It has a display screen, an alphanumerical keyboard, a separate numerical panel, and control function keys capable of generating up to 42 specific codes.

c. The Master Aid 213 is used for programming the 100 and 200 series. It is also equipped with a display screen and an alphanumerical keyboard, but in addition has a semi-graphic character device for creating symbols. It can be used to put complete diagrams on the screen, and copies can be made on paper by using a printer.

In terms of software, the original feature of the Asea Master family is that it uses a natural language adapted for process engineers. This language, developed by ASEA, can be used to create structures in the same way as a process designer would design the functional diagram for regulation of a system. It is built up based on logic functions. The designer can then choose those which are necessary, place them on the screen,

and introduce interactions. The program is created in a conversational mode. The Master Aid programming module then integrates the data and can provide all the documentation required: the finished program, a complete schematic, and list of interconnections.

The system can be further enriched by connecting to the Asea Master the intelligent terminal "Tesselator" introduced by ASEA in 1981, of which over 300 have already been sold all over the world. This is an intelligent terminal which can be used to generate all sorts of characters and symbols, thus creating schematics of complex forms in different colors, etc.

With its 50 systems now installed, ASEA is now looking to this new family to augment its position in the process control market. In addition to France, the Asea Master has just been officially introduced in the Federal Republic of Germany and in Sweden. Its objective for 1985 is a turnover in this sector of approximately $90 million. Of course in France its ambitions are somewhat more modest, because of its very limited presence in the market until now, which Mr Gilles Breguet, the head of ASEA-France, readily admits. For this year his forecasts are for a sales turnover of about 20 million francs. And according to Mr Breguet, that figure should more than double between now and the end of 1985.

7679
CSO: 3698/331

MEETING FORMULATES PROPOSALS FOR FRENCH ROBOTICS INDUSTRY

Paris ZERO UN INFORMATIQUE HEBDO in French 9 May 83 p 48

[Article by Jean-Louis Cousin]

[Text] How can France have a "successful robotics industry"? The question seems as interesting as the answer is uncertain. There is a pleasant surprise, however: our country has a real opportunity to assume a good position on the international market. The specialists invited to a day of talks last Tuesday by AFRI (French Industrial Robotics Association) and the international division of the Parisian Chamber of Commerce and Industry (CCIP) are convinced of it. It was a day marked by a whole series of proposals aimed at taking advantage of this opportunity.

"The brand image of French robots is good. This is true in the United States and Japan and even in South East Asia," Michel Parent, president of AFRI, noted as he summed up the working session. And he added: "If we want to tackle this robotics market, we must be involved in the entire market, and not just in a small part of it."

Study Travel Abroad

AFRI has become the gathering place for everyone interested in the subject in France, whether they be builders, researchers, government agents or even users. Meeting under its aegis and that of the international division of the Parisian Chamber of Commerce and Industry, nearly a hundred different experts in the field came to take stock of the industry last Tuesday.

One of the purposes of the meetings was to draw conclusions from study trips made over the past 2 years to Japan, Germany, Italy and the United States.

But, more importantly, it provided an opportunity for a multitude specific proposals. These came primarily from the finance committee, whose many members from varied backgrounds met five times to work out these proposals.

They said that they were inspired both by the July 1982 report of the robotics mission led by Jean Petiteau (see ZERO HEBDO No. 708, dated 2 August 1982, pp 1, 4 and 5) and by Lasfargue's Economic and Social Council report which preceded it (ZERO HEBDO No. 668, dated 15 March 1982, pp 42 and 43).

Before even announcing a single one of these new proposals, the committee's rapporteur, Alain Van Bockstael, a professor at CESA, stressed two principles that the majority of the members regarded as essential.

"First, financial aid cannot replace a solvent demand and a competitive supply, and secondly, we must make sure that the considerable volume of already existing aid is better known and used," the speaker said by way of introduction.

One Hundred and Fifty Types of Aid Already!

On specifying that 150 different aid packages had already been counted at the present time, Alain Van Bockstael noted that: "The increase in agencies and the diversity of their criteria, if not of their objectives, threaten the cohesion of the sector."

If our system of financial aid does not generally have any failings or serious defects in comparison with our main competitors, the financial status of the French robotics industry is, all the same, not good.

This led to the following suggestion: "The whole gamut of existing financial assistance must be made more efficient."

And, Alain Van Bockstael added: "We must not be led to believe that a little or even a lot more money would be enough to increase the French demand for and supply of industrial robots. What the French robotics industry needs most of all is ideas on strategy, commercial and industrial choices, commercial activities in France and abroad, and a rosier economic outlook."

"Public support and activities of agents in the various financing and aid circuits must be guided upstream by a clear strategic view of what the French robotics industry should and can do," the report noted.

Four Main Proposals

Twelve proposals designed to improve "the fluidity of relations between all the parties involved" (see the box at the end) were put forward. Alain Van Bockstael stressed four of them in his comments.

-- Creation of bid insurance. The committee felt that this should be based on the prospecting insurance and supply insurance plans suggested by COFACE for exports.

It would be confined to manufacturers located in France, who, by paying an annual premium, would receive coverage for the expenses involved in preparing a bid, in the event the bid was not accepted by the potential user, who accepted a competitor's bid instead. The deficit of an insurance plan of this sort would be offset by the Financial Agency of the Robotics Industry, the establishment of which is suggested further down on the list of proposals.

Productivity Contracts

-- Productivity contracts: Referring to objectives set during the time of Jean-Pierre Chevenement, members of the committee suggested that any firm able to increase its output by 7 percent a year without reducing wages or cutting back on jobs could receive certain benefits, such as a subsidized interest rate on its borrowing, preferential access to participatory loans, or a reduction in business taxes....

A tax credit of around 2 to 4 percent of annual wages has also been suggested for workers in firms signing productivity contracts of this sort.

-- Research budgets: "The figures put forward by the Petiteau mission (1.4 billion francs over 3 years) are very conservative estimates of necessary expenditures," the report indicates.

And Alain Van Bockstael explained: "To operate effectively, the budgets for both research and promotion on foreign markets should be indexed on the rate of world growth in robotics."

Promotion Abroad: A Necessary Job

-- Robotics Financing Agency: The members of the committee suggested that this agency could combine the services of ADI [Data Processing Agency] and ADEPA [Agency for the Development of Automated Production]. It would manage and finance the following: the bid insurance, part of the budgets for fairs, shows and other expositions, productivity contracts, premiums related to these contracts, part of the training seminars, research budgets, etc. It would also inform industrialists of other available aid: long term loans, aid for innovations, tax credits, etc....

"The industrial modernization fund, which Laurent Fabius plans to institute, could perhaps form this single banking window," Alain Van Bockstael observed in this regard.

Finally, the work needed to promote and develop commercial networks abroad, already referred to earlier, was highlighted by all those who spoke at the meetings.

Coming back to this theme in his conclusion, Michel Parent said that this work could take the form of films illustrating our products, systematically organized presentations and demonstrations of material in the countries that are most interested in the French products, and, conversely, invitations to foreigners to visit us.

Financial and Marketing Aids

All that remains now is to find out precisely what the new Industry minister's view is on the "productive plan" drafted at the initiative of his predecessor.

We do know generally that he is in favor of less state intervention. However, here the assistance of the state is desirable and desired, since, according to AFRI, the work that needs to be done is more in the area of selection than of increased financial aid.

Let's hear the final comments of Alain Van Bockstael in this regard.

"It is not enough just to offer aid, you have to know how to 'market' it. It is not enough to ask for aid, you have to know how to 'sell' your firm. It is obvious that marketing should be involved to a greater extent in all financial aid."

Twelve Proposals to Promote Robotics from the AFRI and CCIP

- "Approach" Financing

a) Creation of bid insurance;
b) Increase of budgets for robotics fairs and professional shows in France and increased financing for "showcase" operations abroad.

- Financing Purchases

c) Reduction of the amortization schedule for industrial robots;
d) Subsidized interest for lease purchases;
e) Exemptions on loan repayments or extension of the terms.

- Productivity Contracts

- Financing the Use of Robots

f) Productivity premiums (25 to 40 percent of financing for research to modernize production facilities);
g) Medium- or long-term contracts offered by government enterprises for subcontractors committed to automatization;
h) financing for regional and sectoral seminars.

- Financing the Production of Robots

i) Increase in research budgets;
j) Increase in ANVAR innovation premiums;
k) Offer to manufacturers of components of benefits available to robot manufacturers.

- Creation of a Robotics Financing Agency.

9805
CSO: 3698/325

THOMSON WILL DISTRIBUTE DAINICHI ROBOTS

Paris LES ECHOS in French 17 May 83 p 11

[Text] In the small, booming world of robots where market prospects seem to be unlimited, every major electrical or electronic firm is trying to blaze a trail. At the start of the year, the Electro-Mechanical Company (CEM) signed a reciprocal distribution agreement with the Japanese company, Yaskawa Electric MFG (which sold 1,000 robots during the 1982 fiscal year). The CGE already has several subsidiaries working in robotics, including the workshops and yards of Brittany (ACB). Matra is relying on Sormel.

Today, it is the Thomson group's turn to enter the arena. Its subsidiary, Auxilec, which is part of the Thomson-Lucas branch, has just concluded a tripartite agreement with the Japanese firm, Dainichi Kiko, and a British company, Dainichi-Sykes Robotics Ltd., with British capital (Sykes group).

At the same time, the Thomson group has announced the revival of a small company in Caen, Automatisme Europeen, specializing in robotics and clamping equipment (30 employees, 6.5 million in revenue in 1982).

"Under the agreement, Auxilec will distribute Dainichi Kiko robots in France, Spain, Italy and Portugal, and the companies will cooperate to develop subassemblies." For instance, we could supply them with mechanical parts or components manufactured by Automatisme Europeen," a spokesman at Thomson said.

But the Japanese are quick to add: "A future plant is far from being excluded, either in France or someplace else in Europe."

The young Japanese manufacturer Dainichi Kiko (DNK) confirms its export ambitions with this agreement. Founded in 1977 by its current director, Mr. Kohno, Dainichi exported 70 percent of its sales last year (totalling about 150 million francs). Its president expects quite simply to double its sales every year and to rapidly become number two in Japan. This would be no small feat, considering how strong the sector is in Japan. Total sales of the 50 largest manufacturers in the country amounted to $363 million, or a 36 percent increase over the previous year.

9805
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PRIORITY ON MODERNIZING, AUTOMATING INDUSTRIAL PRODUCTION

Paris L'USINE NOUVELLE in French 12 May 83 pp 63-65

[Article by Alain Pauche]

[Text] Both experts and industrialists are unanimous in deploring the French lag in CIM [Computer-Integrated Manufacturing], for what is at stake here is quite crucial. Laurent Fabius, who has just received the CIM program prepared by his staff, has seen the urgency of this report and the two imperatives it entails: the creation of groups with major resources, and the preparation of a worldwide strategy.

For a few days now the minister of industry and research, Laurent Fabius, has had in his possession the CIM report prepared about 10 months ago by the staff of the general division of industry.

Of all the reports treated as top-priority matters by the administration (electronics, office automation, the use of computers in education, biotechnologies, the creation of businesses, and the continuation of the reorganization of the nationalized industrial sector), the report dealing with CIM is without any doubt the most ambitious and the hardest to implement.

According to a technical adviser to Laurent Fabius, the start of the CIM program (and not of the plan, as had been intended by Jean-Pierre Chevenement), "is obviously essential." After a period of uncertainty about the future of some major projects, which has characterized the actions of the ministry in recent weeks, Laurent Fabius now has in hand a key report going to the heart of the modernization of the manufacturing industries, the development of high-tech equipment (robots, advanced design machinery, CFAO [Computer-Aided Design and Manufacturing], systems engineering), industrial investments, and improvements in productivity and personnel training.

The magnitude of the stakes involved, and the difficulty of deciding on a course of action--and thus of making choices and finding the necessary financing sources--combine to explain the hesitation of the government. But these factors do not justify this cumulative delay, particularly as the projects prepared by industrialists in both the public and private sectors seem to have been frozen, in the expectation of something which can not happen before several more weeks. Jacques Catrain, the director of Cerci, a member of the Jeumont-Schneider group, which has great ambitions in the field of robotics, flexible workshops, and software designed for the needs of PMI [Small and Medium Industries], is unhappy that his development report, presented 10 months ago, has not yet been discussed.

The stakes involved are indeed considerable. This has been pointed out by many working groups during the past 12 months. Jean Persuy (FIMTM [expansion unknown]), Yves Lasfargue (CFDT [French Democratic Confederation of Labor]), Maurice Petiteau (P-DG [Chief Executive Officer] of Sormel), and Alain Fillion (Planning Commission) have each presented a report on the transformation of our manufacturing apparatus. The information is all there.

The first issue concerns the modernization and automation of production processes in the manufacturing industries, which employ 3,200,000 people. Both experts and industrialists are unanimous in deploring the French backwardness in this area, at a time when advanced technologies are developing rapidly, and are transforming the conditions of production. "In some sectors," said Jean-Claude Tourret of the BIPE [Economic Information and Forecasting Bureau], productivity gains between 7 percent and 12 percent of the cost price per work position have been identified."

Such productivity reserves "created" by advanced-design systems and machines will shape the future of all the transformation industries. In the furniture industry, for example, it is possible to achieve productivity gains of 7 percent in panels, 8 percent in seats, and 12 percent in chairs by means of automation, whose applications in this industry have been perfectly mastered. And in the knitting industry, productivity can be doubled in 5 years.

The second issue, less striking than the first, concerns the French supply of CIM. In the first place is mechanics, over three/fourths consisting of PMI. Electronics and data processing are considerably modifying the profile of this industry which, no matter what the cost, will have to adapt and move into areas with a future.

In addition to the automation of the manufacturing industries, and the development of a heavy equipment and software industry, there is a third factor: the equilibrium of our balance of trade.

While the French CIM market is relatively modest (it is estimated at 8 billion, while the turnover of the mechanical industries amounts to 400 billion), the trade deficit is estimated at 1.5 billion. This figure is of concern as the annual growth rates of the CIM markets range between 5 and 35 percent.

At this point, it is easier to understand why the ministry of industry has been reluctant to prepare a battle plan of the type used for the machine-tool industry. The overlapping of the issues involved and the nature of the needs of businesses make it difficult to formalize decisions in a plan of action which would allocate resources to a few large industrial groups.

That may well be a good thing! There are a good many members of industry who support the position expressed by Roland Koch, head of the FIMTM, who considers the development of a mechanics plan inappropriate and ineffective. This position would not be disputed by Laurent Fabius. However, on the matter of the French supply of CIM, Fabius is convinced that France's skill and staff are too widely scattered. And from this concept to imagining the creation of industrial mechanical giants, there is only a short step. The groups concerned would be Renault, Matra, and CGE [General Electrical Company], all of which belong to the public industrial sector (the government holds a majority of Matra's stock).

The "kriegspiel" over CIM is getting started. The administrative preparations have enabled these three large groups to consider in greater depth their strategy in CIM areas. Without any doubt, the most spectacular of these strategies is the idea of associating the mechanical background of the RIET [Renault, Industries, Equipment, and Techniques] with Matra, which is more experienced in electronics and data processing. This project, which is designed to create a powerful group in both hardware and software, is based on an appropriate industrial analysis, which, if the idea becomes a reality, will have to be applied in adapted structures, and above all, it will have to be "sold" to those involved with the two groups.

On one side is RIET with 3,200 employees, and a turnover of 1.6 billion in the automation of discontinuous processes. It deals with special machines and in its catalogue includes robots (Acma

is the leading French manufacturer), assembly machines, handling systems, flexible workshops, and systems engineering. On the other side is Matra, which is in a good position in assembly with Sormel, in handling with Interelec, in CFAO software with Datavision, with flexible assembly centers with Jaz Industrie, and with digital control with Manurhin.

Without this possible joining of forces, the two groups would either have to develop their businesses alone, or design the products they do not have with a partner. In both cases, money is short. "Such large investments can not be financed at a time when Renault is mobilizing all its resources in order to improve its position in the automobile industry," said Freddy Balle, P-DG of RIET.

No one could deny that the creation of groups endowed with strong resources and a world-oriented strategy is a necessity. For in the field of CIM it has become necessary to cover the entire range. The future of these industries can be summed up in an equation: development = new products x financing. Renault can consider no other equation, nor can Matra, which has demonstrated its skill in investing in sectors with a future.

The same is not true of the CGE, on which the ministry of industry is relying strongly. "If the CGE does manage to get together everything it can do in the field of CIM, it is quite capable of amazing us!" In fact, the CGE is involved in almost everything. First and foremost, it is a laboratory and a consumer of CIM materials. Jean-Claude Peugeot, an official of the division of development, in charge of CIM coordination, emphasizes this important point: "Our internal experience must not be underestimated." That is true, but there again it is a matter of organizing, industrializing, financing ("the CGE will receive some funding," it is said at the ministry of industry), and of operating to make a profit.

Supporting the Efforts of Small Groups

Four focal points have been identified:

a. Robotics and flexible workshops: Alsthom and its subsidiaries such as ACB, which is developing robots in hostile environments; CGA (automation systems); CGMS (handling and flexible workshop systems); CIT, CEM (robots);

b. Process control: conventional automation systems, which the CGE intends to orient toward CIM;

c. CFAO: Sintra, CIT;

d. Components: sensors, laser, optical electronics systems.

This explosion in CIM-related activities and the dispersal of skill in this area are not simply a historical accident. Small groups have managed to develop, often for inhouse needs, products which now deserve a wider audience.

The case of AKR is quite instructive in this aspect. The AKR painting robots, developed in 1976 by AOIP and Kremlin engineers (these companies became subsidiaries in 1979), encountered all the development problems facing industries producing high-tech products in an exploding world market. These problems were exacerbated by the size of the company (60 people and a sales turnover of 26 million).

After trying to work out cooperative arrangements with the Swedish firm, Asea, a year ago (a plan that was rejected by the government), and beginning negotiations with Matra (this time it was AKR that did not follow through), Maurice Lande, the director of the company, now hopes to emerge from the financial impasse the company is in. After months of delays, he hopes to be able to count in the near future on French investors encouraged by the government to put in money into a PMI that has managed to win a position for itself in the world robotics markets.

The French Market According to Type of Equipment
(in millions of francs)

Advanced design machines	5,000
Sophisticated robots	300
Industrial data processing	1,200
CFAO	300
Systems engineering	1,200

Finding resources for the company is the most urgent matter. It seems that the ministry of industry has decided to spend between 800 million and 1.2 billion francs a year over a 4-year period (two to three times the funding envelope for the machine-tool plan) in order to stimulate supply.

The second aspect of the CIM program, which is supposed to encourage businesses to invest in CIM equipment, entails even more problems, for it will take a great deal of imagination to create the devices that would appeal to business, and at the very same time be able to explain to employees and to unions that the modernization of the productive apparatus is the only chance for the industry to be competitive in the future.

Can we consider CIM today as a guarantee of future jobs? In many companies, the reason why robots are being tolerated is that jobs are expressly guaranteed. There are truly a great many obstacles. By including the modernization of industry among its primary objectives, the administration will have to realize that it will have to achieve all its objectives.

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CSO: 3698/317

SCIENCE POLICY

INVESTMENTS FOR FRENCH CIVIL R & D BUDGET DOWN TEN PERCENT

Paris AFP SCIENCES in French 11 May 83 p 1

[Text] Paris. Investments in the civil research budget for 1983 have just been cut by about 10 percent, but the budget was left practically unchanged in terms of operating funds which include jobs and the creation of new positions.

This is apparent from the "budget regulation" decisions made public on 6 May by the ministry of economy, finance, and the budget, and published in the JOURNAL OFFICIEL.

In all, the cuts amount to 50 million francs (30 million for the CNRS [National Center for Scientific Research] and 20 million for the INRA [National Institute for Agronomical Research]) for operating funds which, for all of the research organizations together, amount to 13.240 billion francs for 1983, up 19 percent over 1982.

But for investments, 658 million francs have been cut from payments funds and 923 million francs from program authorizations, of a total of 8.823 billion francs. The cuts are as follows: 150 million francs for the Atomic Energy Commission (of a civil budget of over 5 billion francs); 136 million francs for the French Agency for Energy Control; 50 million francs for the National Space Studies Center; 120 million francs for the CNRS; 22 million francs for the Data Processing Agency; 18 million francs for the National Center for the Exploitation of the Oceans, etc.

Program authorizations make up about half of the total research budget. They are used primarily for financing major equipment and new research programs.

Details of the changes in AP [Program Authorization] and in CP [Payment Funds] for the various organizations are shown below.

	AP	CP
National Institute of Agronomical Research	40,000	15,000
Atomic Energy Commission	150,000	150,000
French Agency for Energy Control	100,000	136,250
National Space Studies Center	71,000	50,000
National Center for Exploitation of the Oceans	37,000	18,000
Research and Technology Fund	167,000	35,000
Data Processing Agency	45,000	22,000
Scientific and Technical Information	13,000	10,000
Prospects and Evaluation	8,000	5,000
National Center for Scientific Research and national institutes	214,000	120,000
National Institute of Health and Medical Research	42,000	24,000
Overseas Scientific and Technical Research Office	12,000	7,000
Research Group for the Development of Tropical Agronomy	10,000	6,000
Total	909,000	598,250

7679
CSO: 3698/333

FRG TO FUND ESTABLISHMENT OF NEW FUTURE-ORIENTED COMPANIES

Duesseldorf WIRTSCHAFTSWOCHE in German 3 Jun 83 p 114

[Interview with Klaus P. Friebe, Engineering Association expert]

> [Text] The Federal Research Ministry wants to push the establishment of new technology-oriented enterprises through government-financed model projects. WIRTSCHAFTSWOCHE talked to Klaus P. Friebe of the Berlin Technology Center of the VDI (Association of German Engineers). Friebe is responsible for the execution of the program in the field of microelectronics.

[Question] Mr Friebe, why are such model projects necessary in the FRG where, after all, we have almost 30 years of American experience with venture capital?

Friebe: We cannot simply transfer American experiences to our industrial structure. The very heavy centralization of West German industry and the high level of social security backup support for the employees so far have offered little incentive for anybody to set themself up independently and to establish new, technology-oriented outfits. In the FRG we therefore have little experience in this field. Such model projects are simply necessary to gain that sort of experience. But we only want to supply assistance to get things started. In long-range terms, the market has to do the job itself.

[Question] But why should the government provide start-up aid? Would that not be a job for the banks?

Friebe: There are progressive banks on the German banking scene which are very open-minded toward that idea. But the majority is still rather reluctant. In the case of those banks, we must try to get them to understand so that they will make available the capital which is necessary during the various stages of establishing a new company.

[Question] In the United States, private sources often supply the capital necessary for future-oriented new firms.

Friebe: This sort of thing simply does not work in the FRG because tax legislation does not sufficiently favor high-risk financing investments. This is

where tax law would have to be amended. That is the only way we can divert our roving capital--which often enough flows into depreciation [write-off, tax shelter] companies--to such very high-risk investments. A second reason as to why private capital is still not being supplied sufficiently is this: In the FRG, there is no "over-the-counter" market, a capital market where the yield expectations are also higher for particularly risky investments. Through the model project, we want to alert the German banks also to this market. If they are not careful, then London, a finance center of course, will attract this market in Europe.

[Question] But the FRG already has programs for the establishment of new firms.

Friebe: The programs which we have had so far are not sufficiently future-oriented. This is where company establishments are promoted simply for the sake of founding a company. We, on the other hand, would like to launch product-oriented new outfits through the model projects. The products in this case should come from fields with a promising future.

[Question] Is this sort of thing not possible in the big, existing enterprises?

Friebe: The industrial structure of the future again demands smaller, decentralized operational units. To modernize the industrial landscape, one must on the other hand try very quickly turn out large numbers of units with new technologies. This apparent economic contradiction can be resolved only through government start-up aid. Through the new program, which will soon be approved, we want to set up the mechanism which is necessary for this modernization strategy. We must arouse an awareness among the banks to the effect that it is necessary also to go in for young, high-risk investments. Among creative employees, it is necessary to arouse the courage to undertake such high-risk investments on their own responsibility. In the case of the big corporations, it is necessary to trigger a readiness to let such employees forge on ahead and not to place any obstacles in their way.

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ADVANCED TECHNOLOGIES USED ON ATR 42 DESCRIBED

Paris L'USINE NOUVELLE in French May 83 p 13

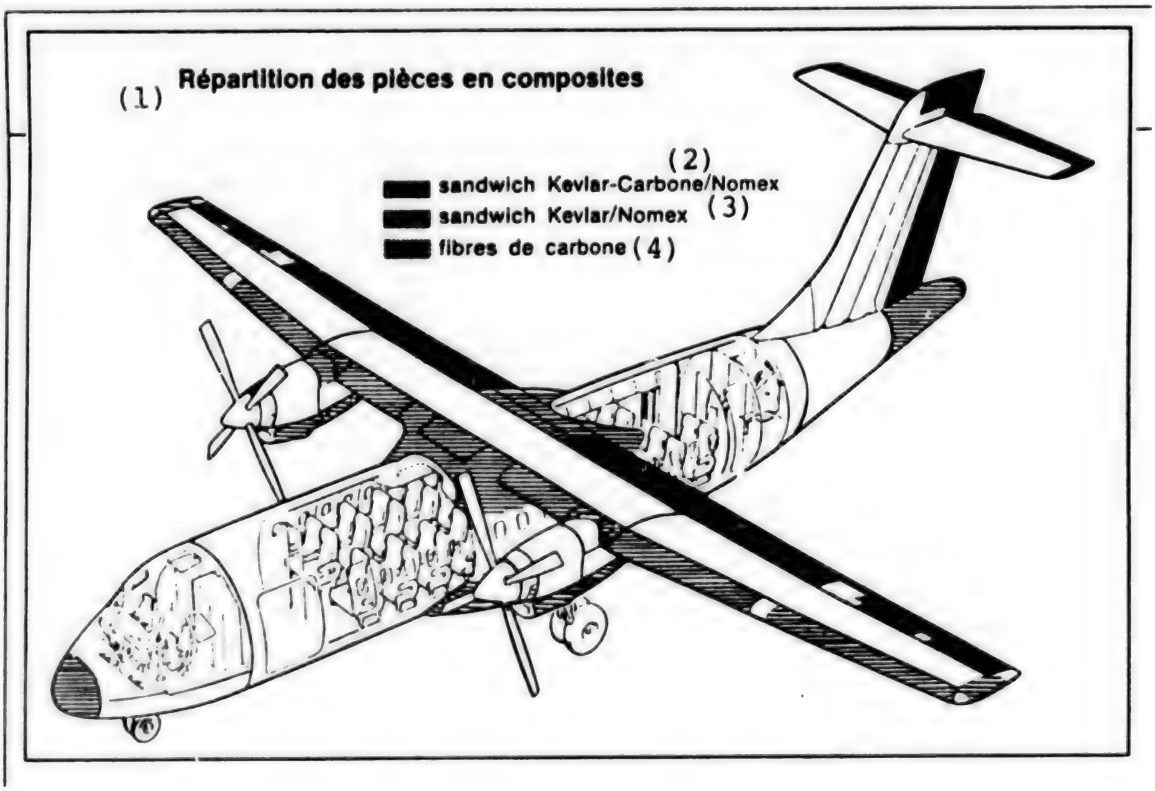
[Article by Patrick Piernaz]

[Text] The group formed by the SNIAS [National Industrial Aerospace Company] and Aeritalia working on the design of the regional transport aircraft, the ATR 42, has applied to a propeller-driven aircraft the advanced technologies reserved until the present time for larger carriers. The ATR 42 will fly for the first time in August 1984, and will be able to carry 42 to 50 passengers on non-stop flights up to 1,300 kilometers in length.

For the engineers in the Toulouse research office, there was a strong temptation to use the powerful resources they had available in terms of scientific computers, and CFAO [Computer-Aided Design and Manufacture]. For they had to face this challenge: to design an aircraft better than the others in order to dislodge its competitors which already had a strong foothold in this market. Technically, the gamble is succeeding, since, according to Aerospatiale the ATR 42 will offer a per-seat operating cost 30 percent less than planes of the older generation, and 10 percent less than planes of the new generation. For example, compared to the Dash 8 which has the same engines, the ATR 42 will be able to carry 10 additional passengers, but will also have a wider body that will offer greater comfort.

This result has been obtained primarily by improving the plane's aerodynamic design. "This is one of the areas we worked on the most," said Pierre Pebereau, chief engineer of the ATR 42 program. "The desire to obtain the lowest possible drag led us to design a special profile based on very precise three-dimensional aerodynamic calculations, CAO [Computer-Aided Design] optimization of the engine pods, and the development of single-rotation lift flaps, with no sliding feature."

"But we also had to work to reduce weight," pointed out Pierre Pebereau, "by using composite materials. In fact, the ATR 42 will include a large amount of composites, such as the Kevlar-Nomex sandwich for the leading edge of the wings, the karmans (wing-fuselage fairings), the radome, the tail cone, and the landing gear fairings; carbon fibers for the lift flaps and Nomex sandwich structures with a hybrid Kevlar-carbon covering for the trailing edge of the wings. These materials were essential in order to save the weight we wanted to."



Key:

1. Distribution of composite parts
2. Kevlar-Carbon/Nomex sandwich
3. Kevlar/Nomex sandwich
4. Carbon fibers

"The first results of the weight calculations showed a fairly significant deviation in relation to what had been expected, and in 1982 we began a major program to reduce weight," indicated Daniel Casses, engineer. "This produced a weight reduction of 320 kilograms: 130 kilos from the wings, 20 kilos from

the fuselage, 90 kilos from systems, and 80 kilos from the engine pods. To eliminate this weight from the engine pods, it was the use of titanium, a material that had not even been under consideration at first, because of its cost, which enabled us to eliminate weight and problems with corrosion of the engine frame, which was made of titanium tubes welded onto forged titanium nodes."

75 Percent of Plans Designed by CAO

"One important point," explained Pierre Pebereau, "is that each time weight is reduced, there is the risk of increasing costs." We constantly had to try to achieve the best compromise. That is why the ATR 42 also uses more conventional solutions: integrally machined panels for the central area, metal reinforced by riveted stiffeners for the external part of the resistant caisson. In addition, the Toulouse research office refused to use servocontrols, which are considered to be more difficult to install and maintain, and decided to use mechanical wire-operated controls, which are more ordinary but sturdy. "All these points explain why the ATR 42, although smaller than an Airbus, was just as complicated to develop," said Pierre Pebereau.

We must realize, though, that in order to manage to resolve these difficulties, the SNIAS did have three strong advantages. One was the American "design to cost" method, which the SNIAS was the first company to apply in France, with the study of the Airbus A 310. This method first sets the cost of a piece of equipment before studying it, and all the later technical choices must fall in line with this guideline. To do this, the engineers have updated cost manuals which enable them to compare and determine costs of possible solutions at any time.

A second advantage is the creation of operational groups including studies, preparation, after-sale service, and production (the technicians came from Nantes or Saint-Nazaire), who worked together around the drawing boards in order to resolve problems right from the very start.

The third decisive advantage is the use of CAO consoles. "We designed 75 percent of the plans by CAO; that is a considerable figure that required that two groups work on 24 consoles," indicated Pierre Pebereau. The result was a significant savings of time on modifications and a more rapid start of the FAO [Computer-Aided Manufacturing] program. "Some parts of plane no 3 were even machined on NC machines before the plans were

drawn on paper." This explains why the program did not fall behind schedule. Production of the primary parts began at the end of 1982, and the first airfoil section will be delivered at the end of this year, a few weeks before the delivery of the first fuselage, which is being made near Naples by the Italians. In all, two sections, one of seven cells and one of 12 cells, were begun. That will allow us to deliver the first five production models of the ATR 42 starting in 1985, and we will then begin production at a rate of four planes per month.

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CSO: 3698/333

BRIEFS

MBB STUDIES A 320 WING DESIGN--Advanced wing designs for the planned Airbus A320 are currently being studied by MBB [Messerschmidt-Boelkow-Blohm]. A wind tunnel model of this 150-seat aircraft, developed by the aerodynamics division in Bremen, according to MBB reports, already supplied evidence of advanced trans-sonic wing-dynamics. Maintenance made at the NLR [National Air and Space Travel Laboratory] high-velocity wind tunnel in Amsterdam yielded an excellent ratio between lift and resistance over the entire speed range for the modern profiled wing. Additional experiments, conducted in cooperation with British Aerospace in the British wind tunnel, confirmed the high performance and quality standard of the currently planned A320 wing. [Text] [Gelsenkirchen AEROKURTER in German Jun 83 p 620] 5058

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